Five-Year Forest and Range Resource Program

FIVE-YEAR FOREST AND RANGE RESOURCE PROGRAM

Submitted to the Legislative Assembly
in accordance with
Section 9 of the Ministry of Forests Act

July 22, 1983

Province of British Columbia
Ministry of Forests

British Columbia Cataloguing in Publication Data - 1983/84 - 1987/88

British Columbia. Ministry of Forests.
Five-year forest and range resource program.

Annual.
"Submitted to the Legislative Assembly in accordance with Section 9 of the Ministry of Forests Act."

1. British Columbia. Ministry of Forests. 2. British Columbia - Forest policy - Periodicals. 3. Forest management - British Columbia - Periodicals. 4. Range management - British Columbia - Periodicals. I. British Columbia. Legislative Assembly. II. Title

SD568.B7B72 354.711'06'82338

1983 Province of British Columbia

R3-81086

TABLE OF CONTENTS

	Page
PART 1: INTRODUCTION	1
The Importance of the Ministry of Forests Act and Five-Year Programs ..	1
Organization of the Report	3
PART 2: RECESSION AND RESTRAINT	4
Recession and the Forest Industry	4
Financial Performance of the Forest Industry	4
Unemployment in the Forest Industry	6
The Need for Government Expenditure Restraint	8
Ministry of Forests' Restraint and Recovery Measures	8
PART 3: FIVE-YEAR FOREST AND RANGE RESOURCE PROGRAM	9
Ministry Programs	9
Management	9
Finance and Administration	10
Harvesting	10
Forest Service Roads and Bridges	12
Forest Service Road: Boundary Forest District	13
Silviculture	15
Basic Silviculture	16
Intensive Silviculture	17
Site Rehabilitation: Chilliwack Forest District	18
Nursery Operations	22
Seed Operations	22
Research	23
Forest Protection	23
Fire Suppression	23
Range Management	24
Recreation Management	24
Respective Roles of the Government and Private Sector	25
Summary	25

PART 1: INTRODUCTION

This Report presents the Province's Five-Year Forest and Range Resource Program for the fiscal years 1983-84 through 1987-88. This is the fourth Five-Year Program submitted to the Legislative Assembly under Section 9 of the Ministry of Forests Act, R.S.B.C., 1979.

The provincial economy, and the forest sector in particular, is showing signs of recovery from the recession; a recession which has had a devastating impact on employment, the financial health of the forest industry and the government's ability to finance the programs and services currently in place. It is in this context that the priorities for the Ministry of Forests have been set: to reduce the size of the Ministry, to increase the role of the private sector, and to aid, enhance and support the economic recovery in the forest sector to the greatest possible degree. This Five-Year Program reflects these priorities.

THE IMPORTANCE OF THE MINISTRY OF FORESTS ACT AND FIVE-YEAR PROGRAMS

The Ministry of Forests Act is an important formal mechanism for government, on the basis of sound analysis, to make decisions on the management of the Province's forest and range resources, and to see that those decisions are carried out. Sections 7, 8 and 9 which are among the more important parts of this Act, are discussed below.

Section 7 - Forest and Range Resource Analyses

The first Resource Analysis submitted in September, 1979, identified, and focussed attention on the main factors bearing on the future health and value of provincial forest and range assets. That Analysis enabled government to assess the effects of its policies and programs on these assets compared to alternatives presented in a companion Five-Year Program proposal, and to make soundly investigated choices on future program direction.

Work on the second Resource Analysis is already underway and a report will be presented in September, 1984. This report will also be of great value:

1. in updating the critically important resource demand/supply trends identified five years earlier,
2. for measuring the efficacy, and the efficiency of policies and programs implemented under the Five-Year Program, and
3. in strengthening the collective knowledge of a large system of vital importance to the provincial economy.

Section 8 - Five-Year Resource Program

The first Five-Year Program proposal, also submitted in September, 1979, introduced corporate planning and standard, business-like operations to a public service organization, the Ministry of Forests. It initiated a regular process in which government, provided with program alternatives expressed in terms of their relative economic and social costs and benefits, would make the major decisions concerning the management and use of provincial resources. Heretofore, the technical basis for decisions in forest management was largely biological.

Successive Five-Year Programs have been directed toward reinforcing these concepts, in particular the establishment of a clear relationship between approved program goals and the resources committed to their attainment. In fact, increasing attention to this fundamental relationship has greatly improved the Ministry's ability to respond effectively to the recent changes in government policies and priorities.

There are two important aspects of the Ministry of Forests Act and the Five-Year Program. The first is that programs are to be addressed to the economic and social realities in the province and when these realities change so must the programs of the Ministry.

The second aspect is twofold. First, financial resources are always limited and successful use of scarce resources depends on good choices being made from a full array of properly researched programs and projects. Second, it is not good enough merely to operate within budgets and to spend money in accordance with administrative regulations. It is more important to achieve and be held accountable for achieving approved program goals efficiently, and in the clear view of all concerned.

In conjuction with the presentation of a second Resource Analysis in September, 1984, the Ministry of Forests will submit Five-Year Program options for improving resource management in B.C.

Section 10 - Annual Report

The first Annual Report submitted under the provisions of the Act introduced the concept of program accountability (rather than fiscal accountability alone), to a public service organization. The second Annual Report, which was recently presented to the Legislative Assembly, and future reports, will continue the establishment and reinforcement of this concept. In this manner performance assessments of Ministry staff and programs including those carried out by the private sector, compared to stated policies, priorities and goals will become a practical reality.

ORGANIZATION OF THE REPORT

This Report presents the total Ministry of Forests' Five-Year Program, including that portion which is carried out by licensees under the provisions of Section 88 (Credit to Stumpage) of the Forest Act, R.S.B.C., 1979.

This Report is organized as follows. Part 2 summarizes the effects of the recession on the forest sector and outlines the major Ministry initiatives for restraint and recovery. Part 3 presents the Five-Year Program for the fiscal years 1983-84 through 1987-88.

PART 2: RECESSION AND RESTRAINT

The impact of the recession on British Columbia has been severe. Large financial losses have been recorded by industry and unemployment remains high.

These circumstances require a reappraisal of the Ministry's programs. Expenditure growth must necessarily be restrained and new initiatives limited to aiding the recovery now underway.

RECESSION AND THE FOREST INDUSTRY

Under Section 4 of the Ministry of Forests Act, one of the purposes and functions of the Ministry is to '...encourage a vigorous, efficient and world competitive timber processing industry in the Province...'. One prerequisite to fulfilling this mandate is an understanding of the financial health of the industry and the outlook for the future.

The B.C. forest industry depends critically on the U.S. demand for forest products in general, and lumber in particular. While demand was falling, rapid and large increases in interest rates in the U.S. in 1981 led to a decline in home construction and this, in turn, to reduced prices and demand for lumber produced by B.C.

Unemployment in B.C. increased quickly and the forest industry sustained large losses in 1982.

Financial Performance of the Forest Industry

Firms in B.C.'s forest industry recorded large financial losses in 1982 as demand and market prices for forest products deteriorated. In the first half of 1983, the outlook for economic recovery in the U.S. economy strengthened considerably and, as a result, the outlook for the B.C. forest industry has improved markedly.

The U.S. forest products market is most important for B.C.'s forest industry. In particular, the U.S. lumber market, which depends on housing starts or construction, is critical. Housing starts, in turn, are very sensitive to mortgage rates.

In the fall of 1979, the U.S. Federal Reserve Board instituted a restrictive monetary policy designed to curb inflation. Conventional U.S. mortgage rates, along with interest rates in general, increased to 16 percent in the spring of 1980, dropped back to 12.5 percent in the summer of 1980, then increased again to over 18 percent in the fall of 1981. U.S. housing starts fell from 2 million in 1977 and 1978 to 1 million in 1982. The lumber market price trend indicator SPF 2 X 4's (kiln-dried 2" X 4", random length, spruce-pine-fir, standard #2 and better), produced in the interior of the Province, dropped from U.S. $275 per MBF (thousand board feet) in August, 1979 to U.S. $125 per MBF in May, 1982.

With the increase in interest rates and the worldwide recession that ensued, the demand and prices for newsprint and pulp were eventually affected . Thus, most firms in the Province's forest industry, including those integrated in a number of products, recorded after tax losses in 1982 as illustrated in Table 2-A.

The nine firms shown in Table 2-A recorded losses of almost a quarter of a billion dollars, after extraordinary items and income taxes, in 1982. These firms account for roughly one-third of the timber harvest in B.C.

TABLE 2-A

Financial Performance of Selected Public Firms in the Forest Industry in 1982

Firm	Sales	Loss
	---- (thousands of dollars) ----	
Balco Industries	36,282	6,550
B.C. Forest Products	799,159	60,961
Crestbrook Forest Industries	93,811	6,199
Crown Zellerbach Canada	654,673	23,269
Doman Industries	130,729	25,974
Gregory Industries	23,153	2,120
MacMillan Bloedel	1,843,100	57,300
Weldwood of Canada	415,201	15,919
Whonnock Industries	222,624	21,189
TOTAL	4,218,732	219,481

Firms in the industry responded to these market conditions and financial results by curtailing discretionary expenditure, plant shutdowns and closures. To ease the impact of the layoffs, many firms took part in the Employment Bridging Assistance Program.

Late in 1982, with conventional mortgage rates in the U.S. at less than 14 percent and falling, housing starts increased to an annual rate of 1.2 to 1.4 million and demand for lumber increased. By January, 1983, SPF 2 X 4's had increased to U.S. $190 per MBF before falling back by $15 per MBF in February as higher prices brought forth increased production. At the end of May, 1983, SPF 2 x 4's increased to U.S. $240 per MBF, the highest price in three and a half years.

As interest rates fall in the U.S. and inflation remains low, the outlook for recovery in the forest industry is good. Lumber prices have risen significantly and recovery in the interior lumber sector of the industry is well underway. Signs of improvement are evident in the pulp market. Improvements in the market for newsprint will likely be slower due to recent large increases in capacity.

Unemployment in the Forest Industry

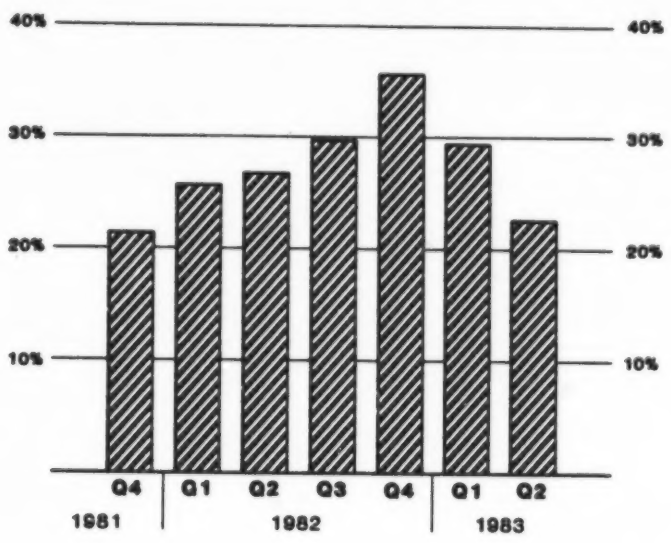
The recession has increased the level of unemployment in B.C. significantly and, in particular, the level of unemployment in the forest industry.

During the first half of 1981, unemployment in B.C. was stable at about 6 percent, based on statistics adjusted for normal, seasonal variation. Through the remainder of that year and through 1982, unemployment increased steadily to over 14 percent; peaking at 14.7 percent in December.

The level of unemployment in the forest industry was, and remains, significantly higher than for the provincial economy as a whole. Figure 2-A shows estimates of the extent of unemployment in the Province's International Woodworkers of America (IWA) union for the last 7 quarters, based on periodic surveys of the number of IWA workers employed compared to the number employed in the spring of 1981.

Figure 2-A shows IWA unemployment increasing from about 21 percent in the last 3 months of 1981 to over 35 percent in the last quarter of 1982. In 1983, unemployment has fallen to about 22 percent, and still remains very high. Similar statistics for non-union employees in the forest industry are not available but unemployment would undoubtedly be high as well.

Figure 2-A: IWA Unemployment in B.C.



Source: Research Department, Regional Council No.1, I.W.A.

Reductions in the level of unemployment in the forest industry depend primarily on the markets for forest products and the financial health of the forest industry. As markets improve, unemployment should continue to fall.

THE NEED FOR GOVERNMENT EXPENDITURE RESTRAINT

The recession has had a serious impact on the government's ability to finance programs currently in place. Expenditure restraint is therefore necessary.

Ministry of Forests' Restraint and Recovery Measures

The Ministry of Forests has put in place or will implement the following measures to restrain expenditure and enhance the recovery in the forest industry:

1. Many administrative regulations or standards have been modified to reduce the impact of the recession and aid recovery. Where warranted, timber harvesting utilization standards have been relaxed, allowing licensees to reduce logging costs and increase the value of products produced. As the recovery proceeds making better utilization economically practical, standards will be revised.

   In addition, the Ministry is examining the profit and risk allowances in stumpage appraisals to ensure they are not an impediment to the return to financial health of the industry.

2. The current plan to increase private sector involvement in implementing the Ministry's programs will be accelerated significantly.

   This will include further delegation of forest management responsibilities to the holder of agreements granting cutting rights to harvest Crown timber, within the framework of the management plans that must be approved by Ministry staff.

3. On-going efforts to improve the efficiency of Ministry operations will also be accelerated and strengthened.

Each of the above initiatives are being treated with all the urgency that the demands of the provincial economy require. With the submission to Cabinet in September, 1984, of the second Resource Analysis and accompanying Five-Year Program proposals, more detailed plans will emerge.

PART 3: FIVE-YEAR FOREST AND RANGE RESOURCE PROGRAM

In the sections which follow, goals and detailed information pertaining to each of the programs of the Ministry are presented, and the roles of the private sector and the government in carrying out the Five-Year Program illustrated. Table 3-D summarizes the forecast expenditure for the first year (1983-84) of the Five-Year Program.

Funding will be achieved through the following three sources:

1. annual appropriations (budgets) allocated to the Ministry by the Legislative Assembly,
2. credits to stumpage payable by licensees in accordance with the provisions of Section 88 of the Forest Act, and
3. federal government contributions through cost-sharing agreements.

Funding for meeting the goals of the latter four years of this program is under review. As noted in Part 2, a number of measures have been taken to improve the efficiency of Ministry operations and to increase the involvement of the private sector in implementing the Five-Year Program. These actions are reflected in the forecasted expenditures for 1983-84 presented in Table 3-D. This process will be continued and it is expected that forecasted expenditures for the ensuing years of the Program will be presented in the next publication of this report.

To assist the Legislative Assembly in understanding more fully forest management activities and their relationship to this Five-Year Program, two examples of actual projects are presented in some detail.

MINISTRY PROGRAMS

Management Program

The Management Program provides executive direction and control for the whole Ministry.

The Program spans all three levels of the Ministry. At headquarters in Victoria, it includes the activities and expenditure of the Executive of the Ministry, Information Services Branch and Strategic Studies Branch. At each of the 6 Forest Region offices, the Program includes the regional manager and regional staff managers. At each of the 46 Forest District offices, it includes the district managers, operations superintendents and support services supervisors.

Expenditures in this Program are primarily for wages and salaries, materials, expenses and supplies. Wages and salaries account for about 84 percent of all expenditures. Materials, expenses and supplies account for the remaining 16 percent.

As shown in Table 3-D, forecast expenditure for the Management Program is $11 million for 1983-84. As a proportion of the total expenditure forecast, this Program accounts for about 3.6 percent.

Finance and Administration Program

The Finance and Administration Program provides the basic infrastructure for the whole Ministry, including buildings, and financial, administrative, personnel, computer systems and mechanical services.

At headquarters in Victoria, the Program includes the activities and expenditures of Financial Services, Personnel Services, System Services, Technical Services, and Legal and Administrative Services Branches. At each of the 6 Forest Region offices, it includes administrative, personnel, training, and technical support officers. At the Forest District level, the Program includes clerical, drafting and service technicians.

The major expenditures are for wages and salaries, and buildings, grounds and offices. The Ministry rents and leases buildings, grounds and offices from the B.C. Buildings Corporation. Payments to B.C.B.C. account for about 36 percent of total expenditures. Wages and salaries make up an additional 41 percent.

Forecast expenditure for 1983-84 in the Finance and Administration Program is $54.8 million, representing 18 percent of total Ministry expenditure.

Harvesting Program

The objective of the Harvesting Program is to make timber available to the forest industry in a manner which reflects provincial forest resource objectives and ensures that the financial interests of the Crown are realized.

At Victoria, the Harvesting Program includes the activities and expenditure of Valuation, Timber Management, Planning, Engineering and Inventory Branches. At each of the 6 Forest Region offices, it includes harvest planning and coordination personnel. At the Forest District level, the Program includes timber, scaling, engineering and inventory resource officers.

The Program is based on an on-going, average annual provincial timber harvest of 75 million m^3, which includes a timber harvest of 67.5 million m^3 from Crown and private forest land under licences issued by or under the administration of the Ministry. The remaining 7.5 million m^3 is from other private forest land and unregulated private timber.

In any year, the timber harvest can vary significantly from 75 million m^3 due to the cyclical nature of the international markets for forest products and the flexibility provided for in licences issued by the Ministry. During the past two years, the harvest fell short of that level but, if markets continue to strengthen, the annual harvest could increase to 75 million m^3 in the near future.

The logging, processing and manufacturing of timber and forest products provides widespread economic and social benefits. In favourable market conditions, the provincial harvest of 75 million m^3 generates directly over 90 thousand person-years of employment and wages and salaries of about $3.0 billion. Due to linkages between the forest industry and other sectors of the B.C. economy, a further 160 thousand to 180 thousand person-years of employment are provided. In total, about 25 out of every 100 employed persons in B.C. depend on the operations of the forest industry.

The forest industry includes some:

- 24 pulp and paper mills,
- 650 sawmills,
- 26 veneer and plywood mills, and
- 120 shingle mills and other wood-using plants.

On average, over the past few years each cubic meter harvested has provided:

- over $90 in exports,
- about $40 in wages and salaries in the forest industry, and
- over $11 in provincial government revenue readily attributable to the forest industry.

The major expenditures in the Harvesting Program are forest management activities (roads and bridges primarily) paid for through Section 88, and wages and salaries. In 1983-84, wages and salaries account for about 58 percent of the total Program expenditure while expenditures under Section 88 account for a further 23 percent. Under favourable market conditions, Section 88 expenditures reach about 50 percent of total expenditures in the Harvesting Program.

Selected goals for the Harvesting Program are given in Table 3-A, including goals for major roads and bridges.

Table 3-A: Harvesting Program Goals

	1983-84	1984-85	1985-86	1986-87	1987-88
Harvest (millions of m^3)	75	75	75	75	75
Small Business Allocation (millions of m^3)	4.9	4.9	4.9	4.9	4.9
Road Construction (km)	587	1 200	1 100	1 100	1 100
Bridge Construction (no.)	116	123	126	124	133

Expenditures under this Program will fluctuate with the timber harvest, especially expenditures under the provisions of Section 88 of the Forest Act for roads and bridges.

Forest Service Roads and Bridges

Forest Service roads and bridges financed through Section 88 are typically major investments required to provide access for the management of undeveloped Crown forest land and timber.

In contrast to smaller branch or spur roads constructed to harvest specific blocks of timber (the costs of which are considered in specific stumpage appraisals), major forest roads and bridges provide access to large tracts of timber, which are harvested over extended periods of time. Often, a single forest road will be used for years by many licensees.

Although the primary purpose of development roads and bridges is to provide access to timber for harvesting, they also serve other purposes. For example, these roads open new areas for recreation and enhance forest protection and management capabilities. In some instances, roads originally developed to gain access to timber have eventually been integrated into the public highway network of the Province.

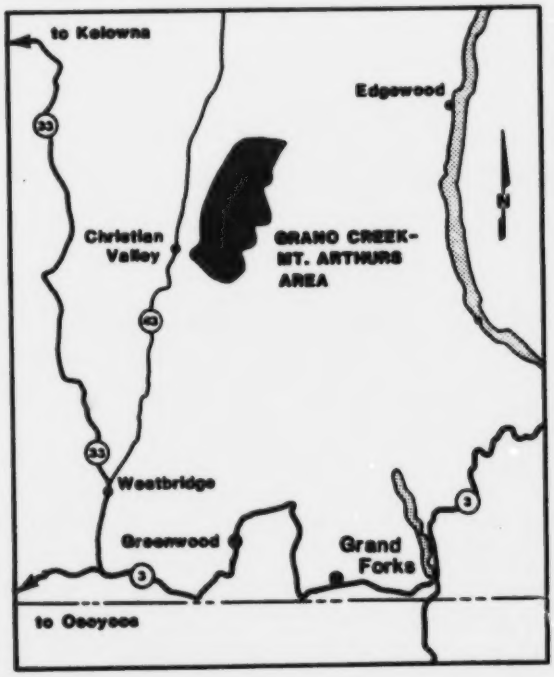
The costs of these roads and bridges may therefore be financed through Section 88. The place these roads and bridges play in long-term forest management is illustrated well by the following example.

Forest Service Road: Boundary Forest District

The harvesting program of the Boundary Forest District, within the Nelson Forest Region, includes the construction of the Grano Creek Forest Service Road. This project is being undertaken now so that the timber in the Grano Creek-Mount Arthurs area will be available for harvesting in 5 to 20 years, and beyond.

The Grano Creek-Mount Arthurs area is about 65 km north of the town of Westbridge along highway 43 (see Figure 3-A) which follows the Kettle River. The Grano Creek Road will have a junction with that highway, a bridge across the Kettle River and will extend east and north for approximately 26 km.

Figure 3-A: Grano Creek-Mount Arthurs

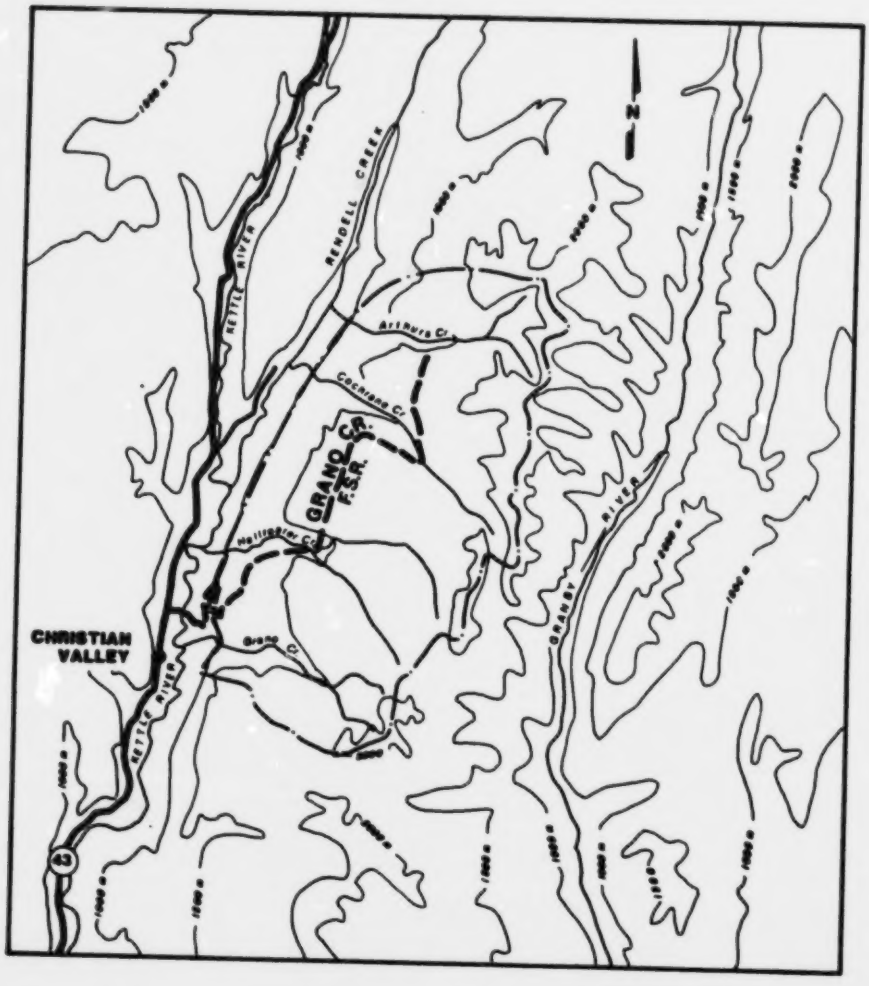


At the present time, access to the area is difficult and use is low. Cattle are moved into the area in the summer to utilize grazing opportunities in the alpine and open forest locations. A rough road constructed in the 1960's for mining exploration still exists but is only useable under favourable conditions. There is a trail along Arthurs Creek to Arthurs Lake which is used by recreationalists. In general, access is limited by private land between the highway and the area which the road will cross.

Compensation for the access across the private land will be determined and paid according to the provisions of Section 102 of the Forest Act.

The location of the road within the Grano Creek-Mount Arthurs area and its relationship to the highway is shown in Figure 3-B. From the junction with the highway, the road will cross private land to a bridge across the Kettle River. The road then rises 500 m from the valley to the 1250 m elevation level and extends through the Hellroarer Creek and Cochrane Creek drainages and into the Arthurs Creek watershed.

Figure 3-B: Grano Creek Road



The Grano Creek Forest Road will have an average right of way of 30 m and be designed for average speeds of 50 km/hr. Adverse and favourable grades will be 6 percent and 12 percent respectively, allowing 42 000 kg loads. The bridge across the Kettle River will consist of two 23 m Glu-lam spans on a steel piling structure.

The total cost of the project (excluding Ministry administration) is forecast at $1.04 million. The project will be undertaken by Pope and Talbot Limited and financed under Section 88 of the Forest Act. Survey and design work is expected to be completed this year and bridge construction across the Kettle River is expected to be completed by next spring. The remaining road is scheduled for construction in the following years and for completion by 1986-87.

The road will provide access to 24 800 ha of Crown land, 40 percent of which is mature timber. The area contains an estimated 2.3 million m^3 of mature, merchantable timber which is primarily suitable for lumber manufacturing. About 40 percent of the volume is lodgepole pine, 25 percent is spruce, 32 percent is balsam, and the remaining 3 percent is Douglas fir, white pine and larch.

About 60 percent of this volume is expected to be harvested during the next 20 years, including aproximately 1.3 million m^3 in the period 1988 through 1997. Pope and Talbot Limited will be the major licensee operating in the area. Some harvesting under the Small Business Enterprise Program could also occur. Timber harvested by Pope and Talbot Limited will be hauled approximately 100 km to their sawmill at Midway. Depending on the incidence of mountain pine beetle and priorities for its control elsewhere in the Forest Region, harvest plans in the Grano Creek-Mount Arthurs area may have to be modified.

The stumpage returns to the Province are expected to be significant. Over the 25 year period 1956 through 1981, stumpage prices (adjusted to account for inflation) in the Nelson Forest Region have averaged $5.00/$m^3$ for spruce and $2.50/$m^3$ for balsam, while over the shorter period 1966 through 1981, stumpage prices have averaged $2.50/$m^3$ for lodgepole pine. At these prices, the timber developed by the Grano Creek Road would return over $7.0 million to the Province in stumpage alone.

In addition to the economic and social benefits which will be generated as this timber is harvested and manufactured into forest products, the Grano Creek Road will provide access for recreationalists, mineral exploration and cattle grazing.

Silviculture Program

The objectives of the Silviculture Program are to restock denuded forest land and to improve the value and productivity of forest stands.

At headquarters in Victoria, the Program includes the activities and expenditure of Silviculture Branch. At each Forest Region, it includes the silviculture officers and, at the Forest District level, includes silviculture resource officers. Nurseries and seed orchards located throughout the Province are included also.

The major expenditures under this Program are for approved silvicultural treatments or activities undertaken by licensees (financed through Section 88) and by contractors (financed through budgetary allocations). Together, these expenditures account for about 68 percent of the total expenditure in the Silviculture Program. Wages and salaries account for a further 20 percent.

The Silviculture Program has four components: basic silviculture, intensive silviculture, nursery operations and seed operations. Each of these components is addressed separately in the following four sub-sections.

Basic Silviculture

The basic silviculture component of the Silviculture Program includes treatments and activities to restock the on-going, current denudation. The major causes of denuded forest land are harvesting and wildfire. Treatments and activities include site preparation (prior to planting or to promote natural restocking), planting, brushing and weeding (to eliminate undesireable competition), and surveys (to plan and monitor all treatments).

There is a direct relationship between the extent or area of forest land denuded, the alternatives for restocking that land and the amount of timber which can be harvested from that land in the future. For each particular type of forest land denuded, the alternatives for restocking generally span the range from waiting until restocking occurs naturally to restocking immediately by planting.

While virtually all denuded forest land will restock naturally, the delays involved vary from a few years to many decades, depending on the tree species, geographic location and productivity of the land. In contrast, planting increases the commercial productivity of forest land by reducing or eliminating restocking delays and by ensuring trees are distributed more uniformly so that more land is producing timber. Planting also allows control of the species composition of the future harvest and influences the quality of the future crop.

In the aggregate, the productivity and future harvest from the forest land currently being denuded depends primarily on the amount or proportion of that land which is planted. With total reliance on natural restocking, average annual productivity is estimated at about 2.50 m^3/ha, with restocking delays averaging 15 to 20 years. Planting all forest land would give an estimated average annual productivity of 3.75 m^3/ha, an increase of 50 percent. Restocking delays would be reduced to 1 to 3 years.

Based on an on-going, annual rate of denudation of about 200 000 hectares, under this Five-Year Program the proportion planted increases to over 50 percent in 1987-88. With that amount of planting, the average annual productivity is estimated to be 3.25 to 3.50 m^3/ha; implying a future harvest at maturity from that forest land of 62 to 67 million m^3.

The goals for basic silviculture for Crown forest land under this Five-year Program are given in Table 3-B, below. Seedlings planted increase over the five year period from 106 million in 1983-84 to about 125 million in 1987-88.

Table 3-B: Basic Silviculture Goals

	1983-84	1984-85	1985-86	1986-87	1987-88
	(hectares)				
Planting	85 000	86 400	91 000	93 600	100 300
Site Preparation	76 600	88 100	93 000	101 100	116 400
Brushing & Weeding	8 600	13 900	13 900	15 200	18 200

Planting seedlings is expensive, labour intensive work. On average, planting a hectare of forest land costs about $250 to $300 and generates about 1.5 to 2.0 person-days of employment. Payment for labour services comprises approximately 55 percent of the cost of planting; a further 15 percent is paid in wages for supervisory and technical support. Employment is seasonal with work concentrated in the spring and fall months.

The employment generated and costs of brushing and weeding and site preparation vary significantly due to the variety of methods involved. Brushing and weeding is accomplished by manual cutting and through the judicious use of herbicides. Site preparation methods include scarification by specialized tractor mounted implements and prescribed burning.

Intensive Silviculture

The intensive silviculture component of the Silviculture Program includes treatments and activities to restock forest land which was denuded in the past, and treatments and activities to improve the value and gowth of immature forests.

Treatments include spacing (reducing the number of trees in young stands to concentrate growth on fewer, select crop trees), fertilization, thinning (to produce timber from immature stands and improve the value of the final crop), conifer release (eliminating undesirable deciduous competition), backlog planting and site rehabilitation.

The goals for intensive silviculture for Crown forest land under this Five-year Program are shown in Table 3-C, below. Seedlings to be planted increase from 10 million in 1983-84 to about 25 million in 1987-88.

TABLE 3-C: Intensive Silviculture Goals

	1983-84	1984-85	1985-86	1986-87	1987-88
	(hectares)				
Backlog Planting	10 200	15 700	16 500	21 300	22 900
Site Rehabilitation	600	600	600	600	600
Spacing	3 600	3 600	3 600	3 600	3 600
Conifer Release	400	400	400	400	400

At the present time, there are over a million hectares of not satisfactorily restocked (NSR) forest land in B.C. Much of that land was denuded many years ago and has received little or no silvicultural treatment. In general, the area contains some of the most productive forest land in the Province and is located close to existing roads, communities and industrial plants.

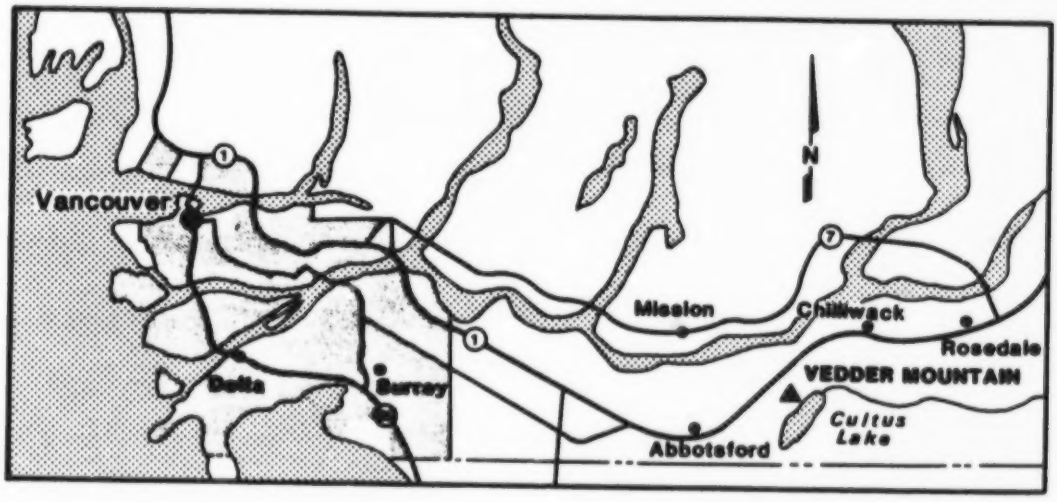
The Ministry is negotiating with the federal government for a cost-sharing agreement to finance site rehabilitation and backlog planting to restock the most productive portion of the NSR. An agreement, if concluded, will be a part of future Five-Year Programs.

Site Rehabilitation: Chilliwack Forest District

The intensive silviculture program of the Chilliwack Forest District includes several large and important rehabilitation projects on Vedder Mountain. It illustrates well the importance of detailed planning, continuity of funding and the biological risks associated with this type of silvicultural treatment. While the estimated costs of the project are high, the potential benefits are correspondingly large.

Vedder Mountain is located about 100 km east of Vancouver, just north of the Canada-U.S.A. border (see Figure 3-C). The Mountain rises from the Fraser River valley to a height of over 900 meters and is bordered by both private land and Cultus Lake Provincial Park. Administratively, it is within the Chilliwack Forest District in the Vancouver Forest Region. For the purposes of timber management, Vedder Mountain is part of the Fraser Timber Supply Area which currently has an allowable annual cut of 1 700 000 m^3 per year.

Figure 3-C: Vedder Mountain



Harvesting of old-growth timber commenced in the area at the turn of the century. A rail line was constructed on Vedder Mountain in the late 1920's and early 1930's to harvest the exceptional stands of Douglas fir. Most of the old-growth timber was harvested between 1934 and 1938. No silvicultural treatment followed the logging.

A major wildfire ran across Vedder Mountain in 1951. Deciduous species (alder, maple and birch) became established as a result of the conditions created by the fire. In the spring and fall of 1958, about 200 hectares of forest land were planted with one year old, bare root, Douglas fir seedlings. This plantation was a complete failure due to factors such as brush and deciduous species encroachment, inappropriate Douglas fir seedlings (too small), and heavy wildlife damage.

Today, of the 3 300 hectares of Crown forest land on Vedder Mountain, 15 percent of the area has restocked naturally, 6 percent is within registered watersheds, 7 percent is being rehabilitated presently, and 58 percent has been surveyed and found to be suitable for rehabilitation. The remaining 14 percent of the area has not been surveyed, but is believed to be suitable for rehabilitation. Therefore, a total of 2 600 hectares could be rehabilitated on Vedder Mountain.

The silvicultural planning and prescription for this work is complex. After detailed planning is complete, seedlings are ordered and nursery work begins. Then, field work begins according to a site-specific prescription. Although the actual prescription for any site or block is unique, all usually include the following five phases which span five years, or more:

1. Slashing/Logging: The field work begins in the fall with the removal, through logging, of any commercial timber values. Opportunities can exist at this stage for firewood cutting. In the winter following logging, all remaining vegetation is cut and left on the site.

2. Herbicides: In the spring following slashing, vigorous new growth sprouts from the stumps of the deciduous species cut previously. A herbicide application, under permit from the Ministry of Environment, is used to desiccate and control herbaceous growth. This phase is essential to obtain effective site preparation and adequately delay brush recovery.

3. Site Preparation: In the early summer following the herbicide application, the dry vegetation is burned through the controlled use of fire.

4. Planting: In the early spring following site preparation, the site is planted, preferably with large, three year old seedlings. Douglas fir is the primary species planted.

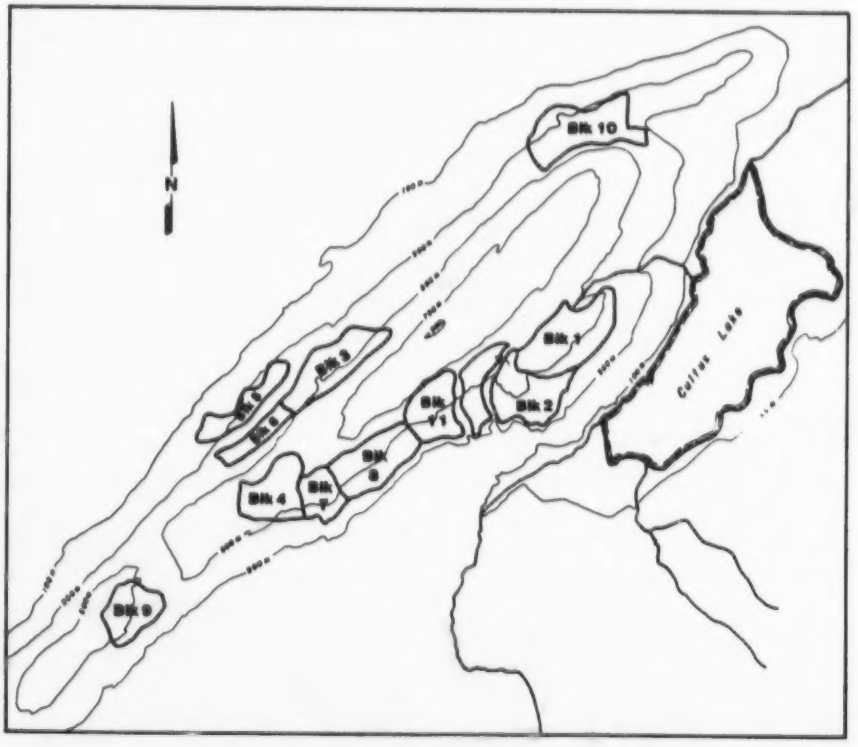
5. Maintenance: In the one to, perhaps, three years following planting, the plantation is monitored through surveys and inspections to detect and schedule further actions to prevent or minimize brush encroachment or wildlife damage. The use of herbicides is often necessary to ensure the plantation reaches a 'free-growing' state.

Each phase of this prescription must be intensively planned well in advance, carried out in sequence and on time. Failure is highly probable, otherwise.

The five-year rehabilitation program for Vedder Mountain is shown in Figure 3-D, along with work that is underway currently. Blocks 1 and 2 (101 ha and 136 ha, respectively), treated by Weldwood of Canada Ltd., are in the plantation monitoring phase. Some damage from wildlife and encroachment by brush is evident now. The slashing phase has been completed on Block 7 (43 ha) by Cattermole Timber Ltd. Work is scheduled to begin on Block 10 (90 ha) in 1984-85, on Block 3 (87 ha) in 1985-86, on Blocks 5, 6 and 8 (48 ha, 33 ha and 83 ha, respectively) in 1986-87, and on Blocks 4 and 9 (129 ha) in 1987-88. This schedule depends on the necessary approvals by the Ministry of Environment for herbicide applications.

Rehabilitation of Vedder Mountain will be expensive. Based on experience to date, the average cost (including nursery stock, excluding silviculture administration) is forecast to be about $2,000/ha. Depending on the characteristics of the particular block or site, costs could range from about $1,500 to $2,500/ha. Costs are expected to fall as experience is gained in the use of controlled fire as a site preparation tool. The rehabilitation work to date has been financed primarily through Section 88 of the Forest Act; with the Ministry undertaking the planning, layout and monitoring responsibilities, and licensees undertaking the work themselves or through contracts with specialized firms.

Figure 3-D: Vedder Mountain Rehabilitation Program



Vedder Mountain is one of the most productive areas of forest land which remain available for timber production and has the potential to produce exceptional stands of Douglas fir. This forest land has the capability to grow 16 m^3/ha each year. Fifty years after establishment, these plantations have the potential to produce 800 m^3/ha with trees 40 m tall. While the 2 600 ha suitable for rehabilitation comprise less than 0.5 percent of the productive forest land in the Fraser Timber Supply Area, they could supply about 2.5 percent of the allowable annual cut on a sustained yield basis.

The stumpage returns to the Province are expected to be high. Over the 25 year period 1956 through 1981, Douglas fir stumpage prices (adjusted to account for inflation) have averaged about \$12.50/m^3 in the Vancouver Forest Region. The proximity of Vedder Mountain to the Vancouver log market, the existence of good access roads and the potential productivity of the land indicate a much higher stumpage price. Based on average log prices over the period 1977 through 1981, the timber that could be grown would have a log market value of approximately \$70/m^3, with harvesting and transportation costs of \$25/m^3. After allowances for profit and risk, stumpage returns to the Province would be about \$35/m^3, or \$28,000/ha.

The rehabilitation work, especially the slashing, planting and maintenance phases, will provide employment opportunities immediately. In the future, timber grown on Vedder Mountain will provide the wide-spread economic and social benefits associated with the harvesting of timber and manufacture of forest products.

Finally, if the forest land scheduled for rehabilitation remains as it is today, it is highly unlikely that any commercial timber values will exist several decades from now.

Nursery Operations

The nursery operations component of the Silviculture Program produces the seedlings required for all planting. Under this Five-Year Program, the primary goal for Ministry, licensee and commercial nurseries is to expand production to produce 150 million seedlings for restocking Crown forest land in 1987-88. Seedling production over the five-year period is expected to be 660 million.

Seed Operations

The Ministry and the private sector will continue the expansion of seed orchard facilities to meet the goal of producing sufficient genetically improved seed for 40 million and 80 million seedlings for coastal and interior planting, respectively, by 1995.

Research Program

The Research Program performs a service function to forest and range resource management programs by providing improved knowledge and methods for achieving objectives, based on scientific investigation.

The Research Program is directed primarily at the biophysical aspects of forest and range management on Crown forest land. It encompasses applied research, technical consulting services, research extension and collaboration on operational testing of applied research results, including the administration of research projects approved under Section 88. This is achieved through the Research Branch in Victoria and research officers at the 6 Forest Region offices.

Forecast expenditure is $7.7 million in 1983-84.

Forest Protection Program

The objective of the Forest Protection Program is to protect the forest and range resources of the Province from damage by wildfire and pests, such as insects and diseases.

The Forest Protection Program provides fire and pest management services directed toward the reduction of timber losses and the maintenance of public and environmental values. The Program includes the activities and expenditures at Protection Branch in Victoria, protection officers at the Forest Region level, and protection resource officers at the Forest District offices.

Expenditure under Section 88 provides for the implementation by licensees of approved fire protection and pest control projects on Crown forest land under licence.

Apart from small changes, the Forest Protection Program will be continued according to the schedule approved previously. The major goal is to keep the area burned by wildfire below 69 000 ha and the timber volume loss below 2.57 million m^3 each year.

Expenditure is forecast to be $13.9 million in 1983-84.

Fire Suppression Program

The Fire Suppression Program provides fire-fighting services directed towards the control of wildfires. The Program is linked closely to, and supported by, the Forest Protection Program, but is managed and funded separately.

The budget for 1983-84 is $50 million. This is about $40 million in excess of the budget in the first Five-Year Program. The change reflects a new policy to incorporate sufficent contingency funding into the budget to match the expected expenditure in a "bad" fire year.

Range Management Program

The objective of the Range Management Program is to supply forage for domestic animals, while conserving the resource base so that future forage production will continue in a manner consistent with integrated use objectives for Crown land.

The Program includes the activities and expenditures at Range Management Branch in Victoria, range officers in Forest Region offices, and range resource officers at the Forest District level.

The major goal for Range Management is to continue to provide 934 000 Animal Unit Months (AUMs) of forage to the ranching industry each year.

Forecast expenditure is $4.3 million in 1983-84.

Recreation Management Program

The objectives of the Recreation Management Program, within the Ministry's integrated resource use framework, are to maintain and enhance recreational values and to provide a system of sites and trails to facilitate public recreational use of Crown forest land.

The Program includes activities and expenditures at the Recreation Management Branch in Victoria, recreation officers in the 6 Forest Region offices, and recreation resource officers at the Forest District level.

Expenditures under Section 88 provide for the implementation by licensees of approved projects to develop and maintain recreation sites and trails on Crown forest land.

Forecast expenditure is $3.8 million in 1983-84.

RESPECTIVE ROLES OF THE GOVERNMENT AND PRIVATE SECTOR

The Ministry sets objectives, determines policies, develops and implements programs in concert with the private sector. It also measures performance. On Crown forest lands the private sector carries out contracted operations and treatments financed by the Government.

For 1983-84, the respective roles of the Crown and the forest industry (through Credit to Stumpage) concerning the implementation of the total Ministry program are about 80 percent and 20 percent in terms of overall funding. In favourable market conditions, the forest industry portion of overall program has reached 38 percent of total spending.

The Ministry's policy is to utilize the private sector in its own portion of the operational activities wherever possible. In this regard, it should be noted that about 22 percent of Ministry direct expenditures are being contracted to the private sector. Overall, this means that approximately 37 percent of total Ministry program is carried out by the private sector. In favourable market conditions, up to 50 percent of total Ministry program has been carried out by the private sector.

The role of the private sector in implementing the Program will increase in future years.

SUMMARY

Forecast expenditure for the Forest and Range Resource Program for 1983-84 is presented in Table 3-D.

TABLE 3-D: TOTAL MINISTRY PROGRAM, 1983-84

Programs	Forecast Expenditure -- (thousands of dollars) --
Minister's Office	144
Management	10,968
Finance & Administration	54,817
Harvesting	65,660
Silviculture	90,350
Research	7,701
Forest Protection	13,886
Fire Suppression	50,000
Range	4,312
Recreation	3,778
TOTAL	301,616